1100-76-82   **Aleksey S Telyakovskiy*** (`alekseyt@unr.edu`), Department of Mathematics and Statistics /084, University of Nevada, 1664 N. Virginia St., Reno, NV 89557, **Eden Furtak-Cole**, King Abdullah University of Science and Tech, Saudi Arabia, and **Clay Cooper**, Desert Research Institute, NV. *A power series solution to the porous medium equation.* Preliminary report.

The porous medium equation (PME) is a nonlinear diffusion equation, where the diffusivity is a power-law function of the unknown quantity. In hydrological applications it will be the hydraulic head. We consider the case of one-dimensional reservoir, which is initially dry, and is of semi-infinite extent. For certain classes of boundary conditions it is possible to introduce similarity variables and reduced initial-boundary value problem for PME to a boundary value problem for a nonlinear ordinary differential equation. We show how to construct a solution in the form of a power series for that nonlinear ODE and obtain the recurrence relation for the coefficients of the series. Also we show that series converges. (Received January 30, 2014)